

**CLAIMS:**

Having described the invention, what is claimed is:

1. A sound-transmissive protective cover assembly, comprising:
- (a) a microporous membrane having first and second surfaces and a perimeter defined by its edges; and
  - (b) a support system having first and second surfaces and an outer perimeter and an inner perimeter;

wherein the first surface of the support system is bonded to the perimeter of the first surface of the microporous membrane to form a bonded outer region within the perimeter and, surrounded by the bonded outer region, an unbounded inner region;

wherein the membrane is free to move independently in response to acoustic energy passing therethrough, and thereby minimally attenuating the acoustic energy;

wherein the assembly has an instantaneous water entry pressure of at least one meter water column and no more than a 3 dB overall transmission loss in the range of frequencies from 300 to 3000 Hz.

2. The sound-transmissive cover assembly of claim 1, further comprising means for bonding the assembly to an acoustic device.

3. The sound-transmissive cover assembly of claim 2, wherein the acoustic device is a transducer.

4. The sound-transmissive cover assembly of claim 1, wherein the assembly further comprises a black color.

5. The sound-transmissive cover assembly of claim 1, wherein the assembly further comprises an oleophobic coating.

6. The sound-transmissive cover assembly of claim 1, wherein the assembly further comprises an acoustic gasket;

wherein the acoustic gasket is bonded to and coextensive with the assembly so as to not impede independent movement of the membrane in the unbonded region.

7. The sound-transmissive cover assembly of claim 6, wherein the acoustic gasket is bonded to the second surface of the membrane.

8. The sound-transmissive cover assembly of claim 1, wherein the assembly has a particulate collection efficiency of at least 99.99999%.

9. The sound-transmissive cover assembly of claim 1, wherein the assembly has a transmission loss of no more than 2 dB.

10. The sound-transmissive cover assembly of claim 1, wherein the assembly has a long-term water entry pressure of at least 1 meter of water submersion for a minimum of 30 minutes.

11. The sound-transmissive cover assembly of claim 1, wherein the membrane is ePTFE.

12. The sound-transmissive cover assembly of claim 1, wherein the support system is an adhesive system.

13. A sound-transmissive protective cover assembly, comprising:

(a) a microporous membrane having first and second surfaces and a perimeter defined by its edges;

(b) a first support system having first and second surfaces and an outer perimeter and an inner perimeter;

(c) a second support system having first and second surfaces and an outer perimeter and an inner perimeter;

wherein the first support system is bonded to the perimeter of the first surface of the microporous membrane to form on the first surface a bonded outer region within the perimeter and, surrounded by the bonded outer region, an unbounded inner region;

wherein the second support system is bonded to the perimeter of the second surface of the microporous membrane to form on the second surface a bonded outer region within the perimeter and, surrounded by the bonded outer region, an unbounded inner region;

wherein the membrane, which is constrained by the first and second support systems, is free to move independently in response to acoustic energy passing therethrough, and thereby minimally attenuating the acoustic energy;

wherein the assembly has an instantaneous water entry pressure of at least one meter water column and no more than a 3 dB overall transmission loss for frequencies in the range from 300 to 3000 Hz.

14. The sound-transmissive cover assembly of claim 13, further comprising means for bonding the assembly to an acoustic device.

15. The sound-transmissive cover assembly of claim 14, wherein the acoustic

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Sub A3

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Sub A4

device is a transducer.

16. The sound-transmissive cover assembly of claim 13, wherein the assembly further comprises a black color.

17. The sound-transmissive cover assembly of claim 13, wherein the assembly further comprises an oleophobic coating.

18. The sound-transmissive cover assembly of claim 13, wherein the assembly further comprises an acoustic gasket;

wherein the acoustic gasket is bonded to and coextensive with the assembly so as to not impede independent movement of the membrane and the first and second support systems in the unbonded region.

19. The sound-transmissive cover assembly of claim 13, wherein the assembly has a particulate collection efficiency of at least 99.99999%.

20. The sound-transmissive cover assembly of claim 13, wherein the assembly has a transmission loss of no more than 2 dB.

21. The sound-transmissive cover assembly of claim 13, wherein the assembly has a long-term water entry pressure of at least 1 meter of water submersion for a minimum of 30 minutes.

22. The sound-transmissive cover assembly of claim 13, wherein the membrane is ePTFE.

23. The sound-transmissive cover assembly of claim 13, wherein the first and second support systems are adhesive systems.

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